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Shasta-Trinity
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Reply To: 3420

Date: April 29, 1992

Subject: Biological Evaluation of Pine Seedling Mortality in
Stands 1-23, 1-24, 2-5, Scott River RD, Klamath NF (FPM Report N92-3)

To: Forest Supervisor, Klamath National Forest

On April 16, 1992 Jim Kilgore, District Culturist, Linda Haugen, Plant Pathologist, and I visited stands 1-23, 1-24, and 2-5 on the Scott River Ranger District. The purpose of our visit was to evaluate the cause of pine mortality in these plantations. Future thinning operations are being planned in this compartment and there is concern about increasing the level of annosus root disease.

These plantations are located in Crater Creek compartment (T. 41 N., R. 7W., sections 11 and 14). They were planted in 1983 and 1984 with Jeffrey pine, ponderosa pine, incense-cedar, and some Douglas-fir depending on the plantation. Site quality is moderate to low. Grass, manzanita, whitethorn, ribes, and Oregon grape are common competitors on the sites.

In each of the three plantations, pines were dead or dying in clumps of 3 to 6 trees. These pockets were not numerous in any of the plantations. Examination of the root systems of the dead trees and surrounding pine stumps from the previous stand revealed evidence of Heterobasidion annosum, cause of annosus root disease. The source of infection for the pockets examined appeared to be the nearby pine stumps that were 16 inches and greater in diameter.

H. annosum usually becomes established in pine stands by aerial deposition of spores onto freshly produced pine stumps. The fungus then grows through the stump's root system and attacks nearby pines through root contacts. Stump size appears to be a significant factor in the development and longevity of annosus root disease pockets. Smaller stumps that become infected tend not to produce much surrounding tree mortality because of the small extent and mass of their root systems. Also, the fungus does not persist on the site. Infected larger stumps can result in root disease pockets of 0.1 acre or more that may remain active several decades.

The limited amount of infection in these plantations and the small size of the regeneration will not result in significant impact to projected growth and yield. Mortality may continue for about another 10 years in the immediate vicinity of infected stumps, but it will not spread beyond the influence of the former tree's root system. It will not persist on the site more than 10 to 20 years.

Stumps produced in future harvesting and thinning activities in this area may become infected by H. annosum because of the increased levels of the disease. Additional entries may increase the amount of inoculum and the number of root





disease centers. In stands that are commercially thinned this may cause mortality of merchantable trees. The application of granular borax to pine stumps following harvest is an accepted practice that will reduce the chance of infection. Stumps of trees less than 11 inches dbh are usually not treated because of the small amount of mortality and spread associated with smaller stumps. In mechanical harvesting operations, however, where trees are cut nearly flush with the ground and duff and soil may cover the stump, an 8 inch size is considered the minimum size to treat. The reason for the difference is that stump heating and drying reduces the chance of successful infection in traditional chainsaw operations because of the higher exposed stumps. During mechanized harvesting, the lack of an aboveground stump may reduce the amount of heating and drying and result in smaller stumps being successfully infected.

This is the second area on the Scott River RD where annosus root disease has been observed in pine plantations within 10 years of harvesting. Both situations were on dry sites somewhat comparable to the eastside pine type of the Lassen and Modoc NFs. Other similar areas on the District should be carefully evaluated prior to any harvesting activities to determine whether annosus root disease may become a concern and if appropriate preventive actions should be taken.

FPM is available to provide further assistance on annosus root disease or other forest pests at your request. We can be reached at the Shasta-Trinity S.O. at (916) 246-5101 or (916) 246-5087.

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